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REMARKS

Prior to entry of the instant amendment, claims 17-35 are pending in the subject application, of which claims 17, 24, and 31 are independent.

Applicant notes with appreciation the Examiner's acceptance of the drawings filed on October 15, 2003.

A. Introduction

In the outstanding Office Action Made Final, the Examiner rejected claims 31 and 33-35 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,453,169 to Callstrom et al. ("the Callstrom et al. reference") in view of U.S. Patent 5,234,777 to Wilson ("the Wilson reference"); allowed claims 17-30; and objected to claim 32 as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

B. Asserted Obviousness Rejection of Claims 31 and 33-35

In the outstanding Office Action Made Final, the Examiner rejected claims 31 and 33-35 under 35 U.S.C. §103(a) as being unpatentable over the Callstrom et al. reference in view of the Wilson reference. This rejection is traversed for at least the reasons set forth below.

The claimed embodiments pertain to a fuel cell having a membrane-electrode assembly. Independent claim 31 of the present application sets forth, in part, "2-10 nm catalytic metal particles coated on the proton exchange polymer membrane; 2-10 nm carbon particles coated on the proton exchange polymer membrane, the catalytic metal particles and the carbon particles forming a nanophase catalyst layer." An indication of the nanophase catalyst layer 21 formed by the carbon particles 22 and the catalytic metal particles 23 is illustrated in FIG. 2C of the application, which is reproduced below.

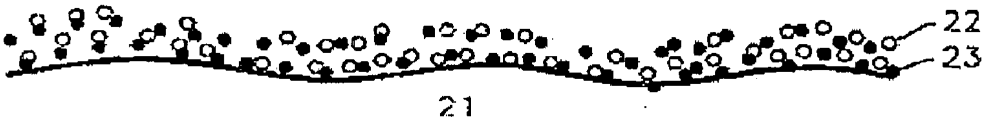

Fig. 2C of the application

The Callstrom et al. reference pertains to a glassy carbon containing metal particles. At page 3, lines 1-2, of the Office Action Made Final, the Examiner refers to column 13, lines 31-38, and to column 14, lines 14-26 of the Callstrom et al. reference, which discuss particle sizes. The Callstrom et al. reference fails to disclose "the catalytic metal particles and the carbon particles forming a nanophase catalyst layer," such as is set forth in claim 31 of the present application.

At page 3, lines 9-5, of the Office Action Made Final, the Examiner states:

> As to a nanophase catalyst layer, it is clear that both the catalytic metal particles and carbon particles are of the nano-dimension, thus, the "phase" of interaction between these particles would naturally flow to be in the nanophase, at least as would be obvious to the skilled artisan. Furthermore, absent of a more explicit recitation of the numerical magnitude of this nanophase layer, the exemplified "2-3 micron thick coating" in Callstrom et al. (col. 14 line 18) is considered a nanophase layer insofar is this coating is equivalent to 2000-3000 *nanometers* in thickness.

However, page 11, lines 21-22, of the specification of the present application discusses a criticality that would clearly exclude the "2-3 micron thick coating" of the Callstrom et al. reference, stating: "If the thickness of the catalyst layer is greater than 100 nm, it is difficult to form the effective interface with the proton membrane." Therefore, the "2-3 micron thick coating," being 20 to 30 times larger than 100 microns, would clearly be unworkable in the present embodiments.

Moreover, the "2-3 micron thick coating" lies outside the range of nanotechnology. The Wikipedia (www.wikipedia.org) sets forth the definition: "Nanophase materials are materials that have grain sizes under 100 nanometres." The Merriam Webster Dictionary (www.merriam-webster.com) defines nanotechnology as "the art of manipulating materials on an atomic or molecular scale..." As a result, the "2-3 micron thick coating" of the Callstrom et al. reference would not be considered a nanophase by one of ordinary skill in the art.

At page 3, lines 16-17, of the Office Action Made Final, the Examiner admits to at least one of the failures of the Callstrom et al. reference, stating: "Callstrom et al. does not explicitly teach the particulars of a fuel cell such as a proton exchange membrane or the electrodes bonded thereto." The Examiner then turns to the Wilson reference. However, the Wilson reference fails to address the deficiencies of the Callstrom et al. reference in disclosing or suggesting "the catalytic metal particles and the carbon particles forming a nanophase catalyst layer," such as is set forth in claim 31 of the present application.

One of ordinary skill of the art would thus not be motivated by the Callstrom et al. reference and the Wilson reference to produce claim 31 of the present application. A *prima facie* case of obviousness has thus not been made. Claims depending upon claim 31 are patentable for at least the above reasons.

For the above reasons, applicant submits that this rejection over the Callstrom et al. reference and the Wilson reference has been traversed, and reconsideration with withdrawal thereof is respectfully requested.

C. Allowable Subject Matter

Applicant notes with appreciation the Examiner's allowance of claims 17-30 and indication of allowable subject matter in claim 32.

D. Conclusion

If the Examiner believes that additional discussions or information might advance the prosecution of the instant application, the Examiner is invited to contact the undersigned at the telephone number listed below to expedite resolution of any outstanding issues.

In view of the foregoing amendments and remarks, reconsideration of this application is earnestly solicited, and an early and favorable further action upon all the claims is hereby requested.

Respectfully submitted,

LEE & MORSE, P.C.

Date: July 16, 2007

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PETITION and DEPOSIT ACCOUNT CHARGE AUTHORIZATION

This document and any concurrently filed papers are believed to be timely. Should any extension of the term be required, applicant hereby petitions the Director for such extension and requests that any applicable petition fee be charged to Deposit Account No. 50-1645.

If fee payment is enclosed, this amount is believed to be correct. However, the Director is hereby authorized to charge any deficiency or credit any overpayment to Deposit Account No. 50-1645.

Any additional fee(s) necessary to effect the proper and timely filing of the accompanying-papers may also be charged to Deposit Account No. 50-1645.